

GaN HBT SUPERLATTICE BASE STRUCTURE**ABSTRACT OF THE INVENTION**

A heterojunction bipolar transistor (HBT) (20) with alternating layers of gallium nitride (GaN) and aluminum gallium nitride (AlGaN) with varying Al composition forming a graded superlattice structure in the base layer (28) includes. The thin layers of AlGaN in the base layer (28) increases the base p-type carrier concentration. Grading of the Al composition in the thin AlGaN layers induces an electrostatic field across the base layer (28) that increases the carrier velocity and reduces the carrier transit time. The structure thus decreases the transit time and at the same time increases the p-type carrier concentration to improve the operating efficiency of the device.